white silver-skinned;' it is also a little less early." It may be noted, further, that the Messrs. Landreth of Philadelphia declare their ' extra early Bloomsdale pearl,' which is remarkably flattened in form to be the earliest of all onions.

In twenty so-called varieties of the turnip, the axial diameter is noted as less than, or equal to, the transverse diameter. Of these, one is called 'very early,' nine are called 'early,' one is called 'rather early,' and five are called ' half early.' In fourteen varieties the axial distance is noted as greater than the transverse diameter. Of these, one is called 'late,' one 'a little late,' one 'medium,' five are called 'half early,' three 'rather early,' and three 'early.' The 'rouge plat de mai de Munich,' described as being 'very much flattened,' is said to be 'unquestionably the earliest of turnips.' The 'rouge de Milan,' called 'very flat,' is pronounced 'one of the earliest.' In the majority of the long-rooted turnips the season of maturity is not noted, — a fact in itself suggestive; for the more depressed forms would hardly be noted as 'early,' if they were not earlier than others.

It may be objected to this hypothesis, that a root or bulb that grows in a round or flattened form would naturally sooner acquire the requisite size for table use than one that grows long and slender, and that this fact alone is not sufficient to indicate a physiological relation between the form of the root and its time of maturity. The time of the first bloom, and the first ripe seed in different varieties, mark definite stages of development, which, we may assume, are less dependent upon the influence of selection. If, therefore, we find that the time of bloom and of seed maturity bear a relation to the form of the root, we have additional evidence in favor of our hypothesis. We have gathered from records of the station such data as bear upon the point, with the results noted in the following table: —

	No. of varieties.	Average days to first bloom.	Average days to first ripe seed.
Radish (1883).			
Turnip-rooted	6	$57\frac{1}{3}$	$116\frac{1}{2}$
Long-rooted	7	$57\frac{6}{7}$	$123\frac{5}{6}$
Radish (1884).			
Round, or turnip-rooted . .	22	$60\frac{7}{10}$	108
Long-rooted	22	63	$112\frac{1}{2}$
Beet (1883).			
Turnip-rooted	3	$57\frac{2}{3}$	112
Long-rooted	1	59	116
Carrot (1883).			
Short-rooted	2	52	119
Long-rooted	1	69	122

In the radishes, those have been called ' long-rooted ' in which the axial diameter exceeded the transverse diameter. In the beet and carrot the division was necessarily more arbitrary, but the shortest-rooted varieties were called respectively ' turnip-shaped ' and 'short.' It is evident that the figures given in the table sustain the hypothesis, so far as they go. Observations made in the station garden upon many varieties of beet, carrot, onion, radish, and parsnip, indicate, that, in general terms, the degree of earliness is proportionate to the degree of ' flatness ' of the root, though exceptions are not very uncommon.

Should further evidence establish this hypothesis, we have a valuable guide for selection in producing new varieties. We may not only hope to increase our earlier varieties by selecting the more flattened roots; but by rendering the roots of the earliest long varieties short through selection, or possibly through influence of cross-fertilization, we may reasonably hope to secure earlier varieties than have as yet been obtained. For example: the ' early long scarlet ' radish, though it has a long slender root, is scarcely less early than the ' early scarlet turnip-rooted.' It would appear, therefore, that in this variety we have a parent for an earlier radish than is at present known. The roots of this variety vary considerably in thickness as compared with the length. By selecting for seed through a series of generations the roots having the greatest proportional diameter, we may hope to promote earliness. Experiments in this line are already in progress at our station.

EMMETT S. GOFF.

N. Y. agricultural experiment-station.

Domes mounted on cannon-balls.

The chief objection urged against the mounting of rotatory domes on cannon-balls is the difficulty experienced in keeping the balls at equal distances apart. If the dome is much used, this objection becomes a serious one; and no dome so large that it would require more than four balls should be mounted in this manner. If the sill and the bed-plate of the dome are so well built that they retain their figure sensibly perfectly, and the track is kept thoroughly clean, the balls will ordinarily not be found to change their relative position very much, except during the winter season. At this time of the year, and under favorable conditions of temperature, the fine snow which is often driven into the observatory, underneath the dome, will, if allowed to remain in the track, form an icy coating over the balls as they pass through it, no matter what the weight of the dome may be. Under such conditions, if the dome is forcibly moved, the incrusted ball will often change its relative position several feet, thereby perhaps imperilling the safety of the dome. DAVID P. TODD.

A NEW PLAN FOR THE SCIENTIFIC ASSOCIATIONS OF BOSTON.

A SHORT time ago we referred to the difficulty of obtaining a reasonable attendance at the meetings of scientific societies in Boston, and found one obstacle to be the comparative infrequency with which our scientific men come into general contact with one another and with the public. To-day we propose one external remedy, which may serve in time to better this state of things by multiplying the opportunities, and so increasing the chances of contact. By it we believe that not only science, but the whole community, will be the gainer.

Our plan consists in the concentration of the principal scholarly institutions of the city in a

quarter most readily reached from the suburbs, where most of the members reside. Apart from Cambridge, the members are far more largely distributed, than elsewhere, along the lines of the two railways which have their stations in the 'Back-Bay' district; and this region will be directly entered by the new bridge which is to connect Cambridge with Boston. The Massachusetts institute of technology with its Society of arts, the Boston society of natural history, and the Medical school of Harvard college, are already there. Here, too, is the Museum of fine arts; and, most important of all, to it will shortly be removed the Public library. The square containing the Medical school and the site secured for the Public library has remaining upon it a vacant lot large enough for a building answering all probable needs, and seemingly reserved for this very purpose. It is not, however, the only available place.

Here, then, let us construct a fire-proof building of fair proportions and creditable aspect, having one long side, removed from the street, devoted to a well-lighted book-stack, and the rest to larger and smaller halls and offices. Each floor could be devoted to a single institution, with its portion of the book-stack to itself; or it might be shared by two or more smaller societies, which could choose whether they would economize their resources, — perhaps by placing their libraries under one administration, perhaps by occupying on successive evenings the same meeting-room, — or whether they would remain as independent as if in a separate building of their own. By relegating the larger part of its library to its share of the stack, each society, with its choicer books and its special appurtenances, could make its own apartment doubly as attractive as now. If feasible, a common periodical room could attract the readers of all the societies. Each story should be quickly accessible by an elevator. The rooms should be heated by steam, and every assembling-room have, in addition, an open fireplace.

Under this hospitable roof should be gathered, first of all, the American academy of arts and sciences. With its more than twenty thousand volumes, it has altogether outgrown its present illy ventilated gloomy quarters, and must, perforce, soon take its flight to roomier parts. Next, the Massachusetts historical society, the aged members of which have now to climb three flights of spiral staircase to attend a meeting, or consult a book, in a building soon likely to be taken from them by the city, and where its precious collections of some thirty thousand volumes are endangered by the immediate proximity of a theatre. Next, the collections of the Boston medical library association (fifteen thousand volumes), now including the library of the medical school, where nearness to this school would advantage all parties. Next, the library of the Boston society of natural history (some twenty-five thousand volumes), which has outgrown its present quarters, and which would be more useful in closer proximity to other libraries than in immediate relation to its museum: this, however, being already in that general vicinity, is less important for the plan. Finally, this building should accommodate, for meeting-room at least, if not also for their smaller libraries, other societies of kindred aim, some already quartered, others in search of an abiding-place, — the Society of arts, the Appalachian mountain club, the Boston society of architects, the American society for psychical research, the Boston branch of the Archaeological institute of America, the New-England meteorological society, etc.

Then there is a nameless unorganized scientific club in the city, which has monthly dinners here and there, and whose members come together merely to meet or to honor a guest from a distance. Could this be enlarged, organize, and have its headquarters in this building, it would give additional reason for adding a restaurant to the attractions of the place, where, from among the frequenters of these associated (but not amalgamated) libraries, from those who visit the Public library for research, from among the out-of-town instructors of the medical school and the technological institute, one would daily meet at luncheon or

at dinner some agreeable companion. A conversation-room could be added, and the place become a general rendezvous for scientific and literary men; and these rooms could be so arranged as to admit, on precious occasions, of being thrown together, so as to banquet a Huxley, a Helmholtz, or a Pasteur in a suitable place and manner.

If we look for a suitable name to give to the edifice which shall be the free home of the arts and sciences in Boston, what can better represent its local history, its exalted science, its 'divine' art, than the name of 'BOWDITCH'? 'Bowditch hall,' then, let it be; and let those in Boston, and they are many, who honor the sciences and love the arts, make this more than a name, and help the advancement of all these varied institutions at once by securing them a common and a fitting home. The societies can doubtless bear a part of the expense; but the plan is too large for them to carry out unaided, too fair to fail. What other plan could promise such solidarity of all high interests? What better fitted to restore the ancient prestige of Boston's name?

IS THERE A CORRELATION BETWEEN DEFECTS OF THE SENSES?

PEOPLE sometimes assume that a defect of any important sense is balanced to the individual by the increased perception of the remaining senses. For instance: it is often thought that deaf persons have better eyesight than those who hear, and that blind persons have better hearing than those who see. The returns of the tenth census of the United States (1880) concerning the defective classes show clearly the fallacy of such a belief. They indicate that the deaf are much more liable to blindness than the hearing, and the blind more liable to deafness than the seeing.

About one person in every thousand of the population is blind, and one in every fifteen hundred deaf and dumb. Now, if these proportions held good for the defective classes themselves, we should expect to find one in a thousand of the deaf-mute population blind, or one in fifteen hundred of the blind population deaf and dumb: in other words, we should expect to find no more than thirty-four blind deaf-mutes in the country; whereas, as a matter of fact, no less than four hundred and ninety-three blind deaf-mutes are returned in the census.

In the following table, I., I present an analysis of the doubly and trebly defective classes. The information has been compiled from the published statements of Rev. Fred. H. Wines (who had charge of the department of the census relating to the defective classes[1]), supplemented by unpublished information kindly furnished by the census office.

TABLE I.

Analysis of the defective classes as returned in the tenth census of the United States (1880).

Singly defective.		
Deaf and dumb[1]	30,995	
Blind	46,721	
Idiotic	73,370	
Insane	91,133	
Total singly defective	....	242,219
Doubly defective.		
Blind deaf-mutes	246	
Idiotic deaf-mutes	2,122	
Insane deaf-mutes	268	
Blind idiots	1,186	
Insane blind	528	
Total doubly defective	....	4,350
Trebly defective.		
Blind idiotic deaf-mutes	217	
Blind insane deaf-mutes	30	
Total trebly defective	....	247
Total defective population	....	246,816

[1] The 'deaf and dumb' have no other natural defect save that of deafness. They are simply persons who are deaf from childhood, and many of them are only 'hard of hearing.' They have no defect of the vocal organs to prevent them from speaking. A child who cannot hear our language with sufficient distinctness to imitate it remains dumb until specially instructed in the use of his vocal organs. In the above table, the 'deaf and dumb' are therefore classified with those having a single defect.

In the following tables, II.-VII., I have reduced these figures to percentages.

TABLE II.

Percentage of the population of the United States who are defective.

	Totals.	Percentage.
Deaf and dumb	33,878	0.0675
Blind	48,928	0.0975
Idiotic	76,895	0.1533
Insane	91,959	0.1833
Defective population	246,816	0.4921
Population not defective	49,908,967	99.5079
Total population	50,155,783	100.0000

[1] See *American annals of the deaf and dumb* for January, 1885.